

Defining competition in markets: why and how?(Examining the Role of Regulation in an Evolving Healthcare Marketplace)

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Objective. To examine the variety of perspectives from which to study the measurement of competition in the healthcare marketplace. based on a meeting held by The Robert Wood Johnson Foundation in 1996, the authors discuss the complications inherent in the way markets and products are defined by key stakeholders, including economists, policymakers, federal antitrust officials, purchasers, and the competitors themselves. **Conclusion.** The consensus among those who study this issue is that the way competitors, markets, and geographic areas are currently defined, and the ways of measuring competition, are inadequate, due mainly to the fact that both the measures and the definitions have been constructed from very limited data. Confounding this is the fact that analyses of competition are undertaken for such a wide variety of uses and that creating one database to solve the problems mentioned can be extremely daunting.

Recommendations. Future research should examine ways to develop better definitions of the new healthcare structures that are competing with each other and ways to create measures of competition that include these new structures. To remedy gaps in the ability to measure competition, the field might also benefit from a public use data file, similar to the Area Resource File (ARF), that would contain HMO data according to geographic area, as well as provider data, employer data, payer data, and sociodemographic data.

Key Words. Healthcare market competition: definition of, measurement of, stakeholders.

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As the healthcare delivery system in the United States evolves, the nature of competition in the market is changing just as rapidly. Standard market-based economic theory is based on the premise that for markets to operate at economic efficiency (to produce the most product at the lowest price to consumers), in most cases there should be many competitors within the market who, through competition with each other, drive down prices and drive up supply to the economically efficient production point. From the standpoint of economic efficiency, competition is "good," and things that interfere with competition are in general "bad."

This theory is the basis of antitrust laws in the United States.(1) As stated by the Supreme Court, the Sherman Act was designed to preserve "free and unfettered competition as the rule of trade. It rests on the premise that the unrestrained interaction of competitive forces will yield the best allocation of our economic resources, the lowest prices, the highest quality and the greatest material progress, while at the same time providing an environment conducive to the preservation of our democratic political and social institutions."(2)

This proposition is being increasingly challenged in relation to healthcare by analysts, in and out of government agencies charged with enforcing antitrust statutes, and by healthcare organizations. The existence of market imperfections, including imperfect consumer information, is

fairly well established in the healthcare arena (Rice 1997). However, currently being debated is the magnitude of these imperfections and how these imperfections affect the ability of healthcare markets to move toward an efficient equilibrium and best serve consumers (Dranove, Shanley, and Simon 1992; Paulter and Vita 1994; Zwanziger, Melnick, and Eyre 1994).

Healthcare organizations are also increasingly evolving - merging and combining in other ways that often appear to violate the Sherman Act. They may appear to impede competition by restricting provider networks and imposing gatekeeper providers on people. While such actions exclude certain individual competitors, they may also promote competition in the market overall. The extent to which the advantages of restricted networks and integrated delivery systems outweigh the disadvantages to consumers are also being debated both in the literature and the courts (Blumstein 1994; Celnicker 1990; Lynk and Morrissey 1987; Marx and Murphy 1994; Mobley 1992; Paulter and Vita 1994; Spears 1992).

As new organizations of many different forms emerge in the market, they compete in new ways and at varying times for patients, enrollees, provider contracts, and employees. Analysts with differing perspectives are attempting to describe these new entities and to predict how they might look in the future. They are also examining ways in which competition among them is affecting the costs, quality, and satisfaction of all players in the healthcare delivery system across the nation, and within more localized market areas.

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Why do these analysts study competition and competitive behaviors? Reasons are cited by analysts from different fields and perspectives:

- * To see how changes in competition affect organizations;
- * To see if price or quality of services are affected by competition;
- * To inform state legislatures so that they can fairly evaluate antitrust and other anti- or procompetitive proposals;
- * To examine the relationships between short- and long-term effects of the dynamism of today's marketplace;
- * To examine the methods of weighing the benefits of greater efficiency versus less competition; and
- * To understand how providers and plans make markets work for them, and where public policy can play a role.

On November 14-15, 1996, the Robert Wood Johnson Foundation's Changes in Health Care Financing and Organization (HCFO) Initiative sponsored a conference to bring together experts concerned with healthcare competition within geographic market areas. This small invitational workshop was part of a series of meetings designed to bring together researchers with key actors in the system to discuss a topic in an "off-the-record" environment. This meeting on defining and measuring competition lasted 1.5 days and brought together 30 participants including academics, business consultants, managed care company analysts, and federal policymakers and enforcers, including representatives from the Federal Trade Commission, the Department of Justice, and the Health Care Financing Administration. This article is loosely based on the discussions held at this meeting.

DIFFERENT PERSPECTIVES OF ANALYSTS WHO STUDY COMPETITION IN MARKETS

Competition means different things to different analysts. Part of the reason why the methods used to measure competition are not consistent stems from the fact that analysts study competition from a broad range of perspectives and professions (see Table 1). Analysts in different fields face different theoretical, empirical, and legal restraints on the types of analyses they can conduct.

Economists study the effects of competition from a theoretical perspective, in part based on the assumption that under the proper circumstances, [TABULAR DATA

FOR TABLE 1 OMITTED] competition in geographic and/or product markets leads to economic efficiency. They develop theories regarding what happens in markets where conditions are not perfect and then try to test their theories with data. Because their theories are not market-specific, they try to be as generalizable as possible. Their research questions include these: How will changing the circumstances in a market affect various outcome measures (price, quantity, quality, consumer welfare, etc.)? What determines competitive behavior within a market? And when do economies of scale and other efficiency gains counteract the positive economic forces of large numbers of competitors? Since the theory of competitive behavior was derived in part by economists, they have a natural interest in testing whether their theories hold.

Policymakers, and the analysts who support them, sometimes equate their political districts with geographic markets, and want to maximize consumer welfare within those districts. Their incentives are to enact laws or promulgate regulations that stimulate competition or that try to eliminate or circumvent obstacles interfering with competition in markets. Policy analysts usually (although not always) rely on secondary data and conduct short-term analyses focused on a particular issue. Included among their analysis questions: How can I help fix a "problem" related to competition within a market area or prevent such a problem (or problems) from occurring? For example, if constituents are worried that their provider will be excluded from managed care contracts, policymakers might wish to support "any willing provider" or "patient protection" acts.

The DOJ and FTC officials try to ensure that consumer protection regulations and laws are enforced - the Sherman Act in particular, but other laws and regulations that also pertain to anticompetitive behaviors. Federal antitrust enforcers are limited, however, by the specific statutes they are required to enforce. Whether or not a monopoly exists is not the issue: the enforcers can intervene only if the actual antitrust statutes are violated.

Both the enforcement officers and the academic researchers must define market areas, measure competition, and determine the effects of competition on outcome variables. Analyses conducted by the DOJ and the FTC, however, are in-depth studies of one particular area. They interview organizations and players in the market, and they have access to detailed tax and financial data as well as the ability to use subpoena power to obtain confidential documents and to elicit testimony from both of the third parties relevant to a particular action. They are primarily concerned with future actions of the players and with preventing anticompetitive actions from occurring

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(mergers or acquisitions that violate antitrust regulations, for example). However, in some cases they may try to reverse an anticompetitive action that has already occurred - price fixing, collusion, boycotts, or interference with a provider's ability to operate. They are less concerned with events that have already been long concluded or that are difficult to remedy - that is, the past; for example, hospitals that have already merged unchallenged cannot be easily "separated," although courts can order networks to accept previously excluded providers or to change their rates. Many enforcers have been academic researchers at some point in their career and many often return to academia: there is a flow between these communities. Still, the primary motivation for the enforcer is to discuss the aspects of a particular case, not to make generalizable statements about antitrust or anticompetitive events.

Payers come from still another perspective. They usually need to define geographic markets to reflect differences in the costs faced by the providers they must pay. The Health Care Financing Administration (HCFA) computes a county-specific wage index that is incorporated into its formula used to pay hospitals. Hospitals in market areas (counties) that face higher labor input costs are paid more than those in less expensive areas. Similarly, HCFA pays Medicare HMOs by a market-based formula called the Average Annual Per Capita Cost (AAPCC) formula. The market areas used in this computation are currently Standard Metropolitan Statistical Areas (SMSAs, now usually referred to as MSAs), although there is debate over whether these large areas sufficiently capture area cost differentials for many products (Goody 1993; Morrissey, Sloan, and Valvona 1988; Wright and Marlor 1990; Yipp and Luft 1993; Zwanziger, Melnick and Eyre 1994).

Finally, the actual organizations that compete (hospitals, plans, provider groups, integrated networks, etc.) analyze the markets they operate within or conduct analyses to decide if they should enter new markets. They may define markets as states, MSAs, counties, or some smaller geographic unit, or they may make up their own definitions. For large regional companies, market areas are often used as divisions of the company that operate semi-autonomously, with their own budgets, personnel, and management styles. For some providers or plans, local market conditions may spur entirely new or modified product lines. For example, Kaiser Permanente offers point-of-service products in some regions of the country but not in others. Within a given regional market, plans may pay providers differently based on whether they are located in urbanized or rural submarkets and on the supply of competing providers within those localized areas.

DEFINING PRODUCT MARKETS

Given the multitude of organizational and financial arrangements in today's healthcare systems, there are problems with identifying the product of interest and therefore with creating either supply or demand curves for this product. An added complication is that in most cases the people using the services, whose behavior would typically be used to create the demand curve, are not actually paying for most of the services they receive. Therefore, the "derived demand curve" based on underlying consumer utility functions cannot be constructed unless, for example, an insurer purchasing provider services knows exactly what an enrollee would want to purchase and how much the enrollee would be willing to pay for it (and is then willing to purchase based on that person's preferences).(3)

The product of interest must be defined based on the goals of the analysis being conducted. Hospitals, for example, produce multiple products. Which hospital services is the analyst examining? All of them? Do small primary care hospitals really "compete" with large teaching hospitals? If they do, for what services do they compete? The answers, of course, depend on local market conditions and the players. Some small hospitals compete with some large hospitals for some things. Some health plans compete with some other health plans for some employee or hospital contracts. There may be some purely regional, or even national markets. The market for many types of organ transplants, it has been argued, may be the entire country.

The definition of the product being studied is often - but not always - co-determined with the area in which the market exists. For some analysts, particularly politicians or state and local employees, geopolitical boundaries define the areas of interest and what happens outside of those areas is not their concern. For other analysts, however, a geographic market can be determined only after the product to be studied has been well defined.

DEFINING GEOGRAPHIC MARKETS

In a similar fashion, perspectives vary on ways to define geographic markets. For example, managed care plan market areas may differ from hospital or physician market areas, as these organizations develop more and more complex relationships with each other. Even from an antitrust perspective (which in the health industry has generally focused on hospitals), it is difficult to draw these lines, and the courts often make somewhat arbitrary decisions based on subjective opinions rather than on definitive research.

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Local market conditions affect the ways in which markets should be defined and competitive behavior analyzed. Some cities, for example, have strong neighborhoods within which residents tend to stay; in other cities residents are more willing to travel longer distances to seek services. Rural residents travel long distances for many services, including healthcare. This complicates national cross-sectional comparisons. In addition, competitive behavior is co-determined by a variety of factors that are not independent. Markets with the same number or configuration of providers may differ due to differences in the employer/purchaser configuration in each area.

Most analyses have used market boundaries provided by the "compilers of official data" (Schmalensee, in Schmalensee 1992). One can define a specific geographic area first (usually based on some standard geographic unit), then map the firms/providers into the area (between rivers or mountains; MSA, county, township, zip code, etc.). Alternatively, one can build areas around firms/providers based on utilization or price data, which are less political or pragmatic criteria than arbitrary predefined boundaries.

Various "shipping methods" are often used to construct geographic market definitions for a given product. The idea behind this approach is that a geographic area is defined to minimize the customers who travel outside of the area and maximizes the percentage of customers who remain within the geographic area to purchase the product. The Elzinga-Hogarty method is one of those that most commonly appear in the literature (Zwanziger, Melnick, and Eyre 1994; Elzinga and Hogarty 1973).(4) Other commonly used methods include interviewing competitors to determine their "perceived" competition (as in FTC or DOJ cases); or "nearest neighbor" approaches (Garnick et al. 1989; Garnick et al. 1987). These methods are often combined, as in HCFA's definitions of market areas for sole community hospitals (Farley 1985) or rural referral centers, or in approaches suggested by Zwanziger and others (see, for example, Zwanziger, Melnick, and Eyre 1994; Phibbs and Robinson 1993; Connor, Hillson, and Kralewski 1995).

Markets and market areas also differ depending on whether the market is defined as a supply (seller) market or a demand (buyer) market. For example, hospitals need to "sell" services to patients but "buy" labor to produce these services, and the market definitions will be different for each. They need to define one set of market areas to project patient flows, but another set for the physicians they attract and the supplies they use. Hospitals may compute the area from which they can attract staff sufficient to set up different kinds of services: How far will

the ophthalmologists travel? the intensive care nurses?

Due to a multitude of complicating factors, economic theory provides little guidance for the practical definitions of geographic markets (see, in particular, Schmalensee 1989; Zwanziger, Melnick, and Eyre 1994; Goody 1993). Complicating factors include regional versus national firms; "pockets" within larger markets, and the more general issue of market segmentation. For example, in part because it has recently been the topic of several antitrust court cases, it has been questioned whether for-profit and not-for-profit firms can successfully compete with each other. It has been argued that for-profit firms are more concerned with their profit margins and are less likely to provide uncompensated care or other services of benefit to the community in which they operate (Claxton et al. 1997). If for-profit and not-for-profit institutions indeed have different objectives in providing care, then whether they can, or should, be included in the same markets is debatable.

DEFINING "TRUE" COMPETITORS

Studies of competition usually assume that competitors have defined a product and that they know who their competitors are. Even when a competing entity itself can define its product of interest and the geographic market area within which competition for that product occurs and can identify those it believes to be its competitors, these definitions are not always obvious to the analyst who studies them. Analysts may assume that all firms that produce the same product are competitors, but for a variety of reasons, this may not reflect actual firm behavior. Some factors that complicate who "truly" competes are:

* Perceived versus "real" competitors. When predicting behavior, a firm's competitors may include only a subset of firms that actually produce the same product they do. Firms may perceive that some other organizations are competitors when they actually serve different markets or offer different products. Clearly a continuum of managed care exists, but are the ends of the continuum really competitors? Does Kaiser Permanente compete with indemnity fee-for-service plans?

* Active versus potential competitors. Some firms may think more about the "contestability" of markets (that is, firms that are actively trying to take away their market share) rather than the potential competitiveness of the markets (and all of their potential competitors that make the same product). Other players in the market may be satisfied with their current market share, and therefore may not be perceived as a threat.

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* Imperfect consumer knowledge of choices among products. In theory, competition increases people's choices, which in turn allows them to select among competing firms to increase their utility or well-being. Yet the choices are increasingly difficult to define and measure. If consumers do not have the same knowledge of the product or the market as the producers, analyses of competitive behavior in markets may not reflect reality. Are consumers buying what they think they are buying? Is there full disclosure of what their choices really are? Consumer preferences, and therefore their choices, may vary in different markets, a circumstance that would affect studies of competitive behavior even if the configuration of producers in an area were similar. For example, in Boston consumers may prefer downtown hospitals, while Detroit consumers may prefer suburban hospitals - preferences that would show up in analyses of hospital utilization and market share. Consumer preference variables, however, are rarely available on secondary data sets.

Longitudinal versus cross-sectional analyses. Studies of competition and competitive behaviors may analyze one point in time or may span a time period. Analyses of competition that span only a short time period, or that use cross-sectional data comparing different competitive scenarios, may therefore be misleading if firms have long-range rather than short-range competitive strategies. Research data are usually cross-sectional, while antitrust cases are more longitudinal (e.g., what will happen in this particular market if the number of competitors increases or decreases?).

EXISTING MEASURES OF COMPETITION

Commonly used measures that attempt to quantify competition can be criticized for an inability to capture the true nature of competition, especially in healthcare markets. These criticisms are based less on the theoretical inadequacy of the measures than on the grounds that either the product or the market is not correctly defined or that the data necessary to plug into the formula are not available. There is also limited information on economies of scale and on the welfare effects of many of the products often studied in

healthcare markets.

Herfindahl indexes are a proxy measurement for some types of competition but are inadequate given all of the definitional issues already discussed.(5) HMO penetration is possibly a proxy for the increasing cost consciousness of health organizations, or for ways in which the market is changing, although HMO penetration in and of itself does not actually describe the methods for paying providers and

the resultant incentives. The primary reason why HMO penetration is used as a measure of competition is simply that it is one of the only measures for which data are available. The Lerner Index, another measure of monopoly power, is rarely used in studies of the healthcare industry, primarily because obtaining values for price and cost, either marginal or average, is extremely difficult due to the accounting practices used by healthcare firms as well as to the distortions by insurance reimbursement of the prices consumers face.(6)

One emerging measure of competition is the "network tightness index" developed by Len Nichols. This index defines networks as contractual relationships between physicians or physician groups and health plans; health plans are either managed care organizations, such as HMOs, or other insurers that take premiums. The index is designed to supplement the HHI in vertically related health services markets (where different types of providers merge into one organization), compared to horizontally integrated markets (where the same types of providers merge to acquire more market share). The index would help to differentiate markets (1) where providers (physicians, for example) are more fully committed to a particular health plan and have less time available to treat patients in other plans (such as salaried physicians in staff model HMOs), from markets (2) where providers are less tightly bound to a particular network or plan and are more able to treat patients outside that network. In markets with more tightly structured networks - for example, where all of the physicians are committed to only one plan each - consumers have less choice of provider. In these markets, there is less competition among providers but possibly more competition among plans (Nichols 1995).

It is important to note that existing measures of competition are based on the current mix/distribution of competitors within a market area. Many of the questions posed by analysts, however, focus on the effects that actions by one or more players in a market area may have on the future behaviors of players in the market. Studies of future behavior, unfortunately, are limited to simulations for obvious reasons.

DATA

The ability to define geographic markets for analysis is severely limited by the available data. Analysts often need separate data sources to define the market area and then to figure out what the product is. Products are defined by the creator of the data, and they often do not translate well for other users who may use different product definitions. For example, an analyst may know where HMOs are located by MSA, but not by county or smaller geographic

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unit, because HMOs may not keep county-specific enrollment statistics. Most studies of HMO market penetration rely on data supplied by one firm; most studies using hospital data rely on American Hospital Association or Medicare databases, even if these databases do not contain the appropriate levels of disaggregation or the specific variables necessary for a particular analysis.

Analysts of competition in the healthcare marketplace tend to rely either on available secondary data sets (such as those collected by the government or by trade associations) or on proprietary data. All of these data sources are problematic in some way - they are missing data; do not define variables consistently over time; are not available in electronic format; cannot be linked with other data; are often difficult to use or to understand - or in some combination of ways: they are missing data; do not define variables consistently over time; are not available in electronic format; cannot be linked with other data; or are often difficult to use or to understand. Market analyses also usually need data from several sources, and it is extremely difficult to combine databases collected for different purposes that do not have standard definitions or formats.

In today's marketplace, organizations are evolving and combining with other types of organizations. Until these new "virtual" organizations are defined, classified, and polled, no one data source exists that can be used for analyses of these new entities. Yet the fact that organizations are merging also allows for the implementation of more comprehensive and sophisticated data systems as the new entities share technology, data, and resources.

To remedy gaps in data, the field needs a public use data file (much like the Area Resource File, or ARF) that contains HMO data by geographic area, along with other provider data, employer data, payer data (such as Medicare and Medicaid data), and sociodemographics. However, the ARF itself primarily contains old data, because it cannot obtain newer proprietary data. In addition, the ARF was created with HRSA's needs in mind - primarily analyses of health personnel issues.

In addition, a public/private entity (or several) like the "Cochrane Centers" in Europe, could be developed. These centers encourage collaboration by maintaining registers on published reports or systematic reviews of the effects of healthcare; fostering international collaborative review groups; preparing and developing protocols and software to systematize and facilitate the preparation and updating of systematic reviews; and exploring ways to help the public health service providers, purchasers, and

policymakers make full use of the Centers' reviews.

CONCLUSIONS AND NEXT STEPS

In today's healthcare market, competition can be described as a "multidimensional chess game" where the competitors and the players are constantly changing. In many cases, the future cannot be predicted from the past, because no clear stages of evolution emerge through the constant flux. Competition is not all employer driven, and it is not linear over time. This makes it even more difficult to define and to study.

Those who study competition agree that (1) current definitions of organizations (or who is competing) are not adequate; (2) the measures of both competition and market areas that are currently in use are inadequate, but there are no probable alternatives; and (3) this latter inadequacy exists in large part because only extremely limited data are available from which to construct such measures of competition or definitions of market areas.

The uses of the analyses, however, are so varied that developing a database that can meet everyone's needs appears to be a daunting task to undertake. Providers and plans with data on their own performance, enrollment, and costs are not usually willing to share these data with others, because the data would decrease their competitive edge. However, if certain privacy considerations could be assured, it might be possible to share proprietary data; this is currently occurring, for example, within the HMO Group, a consortium of health plans that share data in order to conduct research. (Trade associations can collect data from their members, but not on other types of providers.)

Further, federal enforcement officers cannot share some of the data they collect during their market-specific investigations. When asked if any follow-up analyses took place in the markets that the federal enforcement officers researched to see if the mergers or acquisitions that did occur affected price or quality within the market area, the officers responded that the time and resources needed to conduct follow-up analyses are limited. However, at least some antitrust enforcers are willing to have an outsider come in to perform such analyses?

Several "next steps" and ideas for future research seem warranted. These include:

- * developing better definitions of the new healthcare structures that are in competition with each other;
- * creating new measures of competition that incorporate these new healthcare structures;

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* gaining a better understanding of ways in which consumer, provider, and employer choices shape the healthcare marketplace;

* convening various "keepers" of databases to discuss whether their databases can be linked in any way and made accessible to analysts with various perspectives; and

* maintaining the dialogue among the different types of analysts who study competition and competitive behaviors in the healthcare sector.

The meeting sponsored by the RWJF was a useful first step in the process of better defining the healthcare marketplace and the working of competition within that marketplace. We are encouraged by the recognition of leading analysts that future work in this area cannot continue to use the definitions, measures, and analytic approaches of the past if it is to be of value to public and private policymakers. We were even more encouraged by the interest shown in advancing the field.

NOTES

1. The Sherman Antitrust Act (15 U.S.C.) was passed in 1890. The Clayton Antitrust Act (Title 15 [sections] 12, 13, 14-19, 20, 21, and 22-27) was passed in 1914. The Federal Trade Commission Act (Title 15 U.S.C. [sections] 41-51) was also passed in 1914 and provides authorizing legislation for the Federal Trade Commission.

2. Northern Pacific Railroad Co. v. United States, 356 U.S. 1 (1958).

3. See, for example, Dranove and White (1987); Salmon, White, and Feinglass (1990); and Cassel (1996) for theoretical discussions of physicians' responsibilities to act as agents for their patients, and Dranove and White for the way in which agency is incorporated into health economics modeling. Pontes (1995), however, discusses the business theory of agency, and points out that this theory assumes that agents are also motivated by self-interest, and that when agents' and "principals'" (e.g., clients' or patients') goals are in conflict, the agent may not be motivated to act in the interests of the principals.

4. The Elzinga-Hogarty method can be used to compute the percentage of patients residing within a given area who use the hospitals in that same area, and then, for hospitals in that area, the percentage of patients who come from outside the area (Elzinga and Hogarty 1973).

5. The Herfindahl-Hirschman index (HHI) is the sum of

squared firm market shares (in percentages, with market shares ranging from decimals to 100, or 100 percent). This means that a perfectly competitive market would have an HHI approaching zero (since each firm would have fractional percentages of market share, which would become even smaller when squared), while a perfect monopolistic market (one seller) would have an HHI of 10,000 (or 100 squared).

6. The Lerner Index also attempts to measure monopoly power and is measured by $[(\text{Price} - \text{Marginal Cost})/\text{Price}]$ (Scherer and Ross 1990). Since, in a "perfectly competitive" market, price equals marginal cost, a high value of this index indicates that a firm is setting its prices well above the economically efficient level and that it therefore has some type of "noncompetitive" advantage.

7. A few studies have been published of the consequences of mergers after they occur. See, for example, Eisenstadt and Klass (1988); Wooley (1989, 1990); Vita and Schumann (1991); Paulter and Vita (1994); and Connor and Feldman (1997). Several RWJF studies are under way that examine the effects of mergers in both the hospital and HMO industries.

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